



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/319,678	08/16/1999	ALBERT ESCHENMOSER	514485-3729	3438
34263	7590	05/13/2004	EXAMINER	
O'MELVENY & MEYERS 114 PACIFICA, SUITE 100 IRVINE, CA 92618			TRAN, MY CHAU T	
			ART UNIT	PAPER NUMBER
			1639	
DATE MAILED: 05/13/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/319,678	ESCHENMOSER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	MY-CHAU T TRAN	1639	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 29-63 is/are pending in the application.
- 4a) Of the above claim(s) 30,32-42,44,45,53-59 and 62 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63 is/are allowed.
- 6) ☒ Claim(s) 29,31,43,46-52,60 and 61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1639

## DETAILED ACTION

### *Status of Claims*

1. Applicant's amendment filed 2/17/04 is acknowledged and entered. Claim 29 has been amended. Claim 63 has been added.
2. Claims 1-28 are canceled and claims 29-62 are added by the amendment filed on 9/16/02.
3. Claims 29-63 are pending.
4. This application is a 371 of PCT/EP97/06,907 filed 12/10/1997, which claims priority to a foreign application Germany 196 51 560.2 filed 12/11/1996.
5. Claims 30, 32-42, 44-45, 53-59, and 62 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper filed 4/30/01.
6. Applicant's election with traverse in Paper No. 20 the species of supramolecular nanosystem is the structure of figure 3 is acknowledged. The supramolecular nanosystem structure of figure 3 is the pentopyranose monomers comprising pyrido[3,2-h]quinazolin-2(1)-one as a chelating agent functional group directly coupled to the pentopyranose. The

Art Unit: 1639

pentopyranose monomers are in both the D and the L configurations. No nucleobases are present.

7. Claims 29, 31, 43, 46-52, and 60-61 are treated on the merit in this Office Action.

***Withdrawn Rejections***

8. In view of applicant's amendments of claim 29, the rejection of claims 29, 31, 43, 46-52, and 60-61 under 35 USC 103(a) as being obvious over Goodnow, Jr. et al. (US Patent 5,780,607) and Alivisatos et al. (*Nature*, 8/15/1996, 382:609-611) has been withdrawn.

***New Rejections – Necessitated by Amendment***

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 1639

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 29, 31, 43, 46-52, and 60-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alivisatos et al. (*Nature*, 8/15/1996, 382:609-611) and Pitsch et al. (*Helvetica Chimica Acta*, 1993, 76(6):2161-2183).

Alivisatos et al. disclose a nanocrystal assembly comprising attachment of an inorganic nanocrystal (functional unit) to either the 3' or 5' termini of the oligonucleotide codon (second oligomer) wherein the oligonucleotide codon is hybridized (pairing non-covalently) to a DNA template (first oligomer) to form head-to-head dimers, head-to-tail dimers, and trimers (pg. 610, figure 1). The nanocrystal comprises of Gold clusters (metal). The length of the oligonucleotide codon comprises 18 monomer units and the length of the DNA template comprises either 37 or 56 monomer units (pg. 610, lines 10-14 and figure 1).

The nanosystem of Alivisatos et al. does not expressly disclose that the oligomers are pentopyranose oligomers.

Pitsch et al. disclose oligomers comprises of pentopyranosyl oligonucleotides (Abstract; pg. 2166, fig. 3). The pentopyranosyl oligonucleotides comprise a phosphate backbone (pg. 2174, lines 3-15) and form duplexes (i.e. base pairing) (pg. 2174, lines 16-40; pg. 2167, fig. 5).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include oligomers that are pentopyranose oligomers as taught by Pitsch et al. in the nanosystem of Alivisatos et al. One of ordinary skill in the art would have been motivated to include oligomers that are pentopyranose oligomers in the nanosystem of Alivisatos

Art Unit: 1639

et al. for the advantage of providing a non-enzymic template-directed oligonucleotide syntheses on purine templates (Pitsch: pg. 2181, line 11 to pg. 2181, line 7) since both Alivisatos et al. and Pitsch et al. disclose the method of hybridization of the oligomers (Alivisatos: pg. 610, figure 1; Pitsch: pg. 2174, lines 16-40; pg. 2167, fig. 5). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the combination of Alivisatos et al. and Pitsch et al. because Pitsch et al. disclose data showing the formation of double strands pentopyranosyl oligonucleotides (Pitsch: pg. 2174, lines 16-40; fig. 7-8).

12. Claims 29, 31, 43, 46-52, and 60-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alivisatos et al. (*Nature*, 8/15/1996, 382:609-611) and Pitsch et al. (*Helvetica Chimica Acta*, 1995, 78(7):1621-1635).

Alivisatos et al. disclose a nanocrystal assembly comprising attachment of an inorganic nanocryatal (functional unit) to either the 3' or 5' termini of the oligonucleotide codon (second oligomer) wherein the oligonucleotide codon is hybridized (pairing non-covalently) to a DNA template (first oligomer) to form head-to-head dimers, head-to-tail dimers, and trimers (pg. 610, figure 1). The nanocrystal comprises of Gold clusters (metal). The length of the oligonucleotide codon comprises 18 monomer units and the length of the DNA template comprises either 37 or 56 monomer units (pg. 610, lines 10-14 and figure 1).

The nanosystem of Alivisatos et al. does not expressly disclose that the oligomers are pentopyranose oligomers.

Art Unit: 1639

Pitsch et al. disclose oligomers comprises of pentopyranosyl oligonucleotides (Abstract; pg. 1622, fig. 1). The pentopyranosyl oligonucleotides comprise a phosphate backbone and form duplexes (i.e. base pairing) (pg. 1624, lines 5 to pg. 1627, line 8; pg. 1625, fig. 3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to include oligomers that are pentopyranose oligomers as taught by Pitsch et al. in the nanosystem of Alivisatos et al. One of ordinary skill in the art would have been motivated to include oligomers that are pentopyranose oligomers in the nanosystem of Alivisatos et al. for the advantage of providing a non-enzymic template-directed oligonucleotide syntheses (Pitsch: pg. 1627, lines 11-44) since both Alivisatos et al. and Pitsch et al. disclose the method of hybridization of the oligomers (Alivisatos: pg. 610, figure 1; Pitsch: pg. 1624, lines 5 to pg. 1627, line 8; pg. 1624, Table 1; pg. 1625, Table 2). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the combination of Alivisatos et al. and Pitsch et al. because Pitsch et al. disclose data showing the formation of double strands pentopyranosyl oligonucleotides (Pitsch: pg. 1624, Table 1; pg. 1625, Table 2).

### *Conclusion*

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 1639

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MY-CHAU T TRAN whose telephone number is 571-272-0810. The examiner can normally be reached on Mon.: 8:00-2:30; Tues.-Thurs.: 7:30-5:00; Fri.: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ANDREW WANG can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mct  
May 11, 2004

  
PADMASHRI PONNALURI  
PRIMARY EXAMINER